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## ABSTRACT

Using foreign institutional ownership data in the U.S. from 1990 to 2007, we examine whether foreign institutional investors face liabilities of foreignness (LOF) in the U.S. stock market. We find that foreign institutional investors prefer low information asymmetry stocks more than domestic institutional investors and this preference for low information asymmetry stocks is particularly strong among foreign institutional investors from countries with high LOF. More important, we find that a change in foreign institutional ownership is negatively related to future returns, while this relation does not exist for domestic institutional ownership. The negative relation between the change in foreign institutional ownership and future returns is more pronounced when investors face a greater LOF in the U.S. stock market, for instance, when they are from countries with higher institutional distance, information asymmetry, unfamiliarity, and cultural differences. The negative effect of country-specific LOF factors on the return forecasting power of foreign institutional investors is more evident when they trade stocks with higher information asymmetry. Overall, these findings suggest that foreign institutional investors face significant LOF costs in the U.S. stock market, resulting in their poor ability to forecast returns.



*JEL* Classification: G12, G14, G15, F21

*Keywords*: Foreign institutional ownership, Domestic institutional ownership, Liability of foreignness, Return predictability, Information asymmetry.

## I. Introduction

The importance of foreign equity ownership in the U.S. has increased substantially in recent years. For example, a 2008 Congressional Research Service report shows that in the U.S., foreign investors hold about 50% of publicly traded Treasury securities, 25% of corporate bonds, and 12% of corporate stocks. Despite the importance of foreign equity ownership in the U.S., foreign investors' investment behavior is not fully understood, possibly because of the lack of data on security-level equity holdings by foreign investors. In particular, we know little about what types of U.S. stocks foreign investors prefer, whether they face a disadvantage in trading stocks in the U.S. market compared with domestic investors, and how this disadvantage, if it exists, affects their stock-picking ability.

International business research documents that firms operating outside of their home countries face significant disadvantages relative to local firms in the host countries due to high costs associated with being foreign in host country markets, that is, due to the 'liability of foreignness' (hereafter LOF) (Zaheer 1995; O'Grady and Lane 1996; Mezias 2002; Mata and Freitas 2012). However, these studies focus mainly on LOF in product markets, paying little attention to LOF in capital markets.[1]

In this paper, we attempt to fill this gap in the literature by examining LOF in host country stock markets. We build upon previous research on LOF and extend the LOF literature to international equity investments. Specifically, we examine the extent to which foreign institutional investors face LOF in the host country stock market, the effects of LOF on foreign

[1] Despite extensive evidence on the existence and sources of LOF in host country product markets, we are unaware of any research that examines the LOF of foreign institutional investors in host country stock markets. One notable exception is Bell, Filatotchev, and Rasheed (2012), who extend the LOF theory to foreign capital markets. They argue that since capital markets are more information sensitive than product markets, and capital market participants can rely on endorsements by third parties such as investment bankers and investment analysts for information production, the nature of LOF could be different between product and capital markets.

institutional investors' stock-picking ability and stock holdings in such markets, and the main sources of LOF costs in international equity investments. To address these questions, we use U.S. equity holdings reported in the CDA/Spectrum Institutional 13F and examine whether the return forecasting power of foreign institutional investors is affected by the LOF costs that they face in the U.S. stock market, as measured by institutional distance, information asymmetry, unfamiliarity, and cultural differences (Bell, Filatotchev, and Rasheed 2012).

The U.S. stock market has several advantages in studying LOF associated with international equity investments. First, unlike some emerging markets that restrict foreign equity ownership to a certain level, there is no such foreign ownership restriction in the U.S. (Stulz and Wasserfallen 1995).[2] When a country imposes limits on foreign equity ownership, the estimate of shares held by foreign investors may reflect the binding constraint on ownership rather than foreign investors' optimal choice, making it difficult to draw meaningful conclusions from the analysis. Moreover, compared with foreign investors in other countries, those in the U.S. generally face fewer investment barriers, which have long been recognized as significant impediments to investment. Thus, the lack of an ownership limit and investment barriers makes the U.S. particularly well suited to our investigation of LOF in a host country stock market.[3]

Second, the use of U.S. stock-level holdings data from the CDA/Spectrum Institutional 13F allows us to examine the stock-picking ability of foreign institutional investors before expenses

[2] For instance, Choe, Kho, and Stulz (1999) examine the information advantage of foreign money managers in Korea during a sample period in which foreign investors were not allowed to purchase more than 10% of a firm's total shares outstanding.

[3] There is a possible counter argument that the U.S. is not the optimal country to test LOF in host country stock markets because the U.S. market is among the most open markets in the world and thus the LOF would be fairly low in this market. Coval and Moskowitz (1999) and Ivkovic and Weisbenner (2005), however, show that domestic U.S. investors located near a firm's headquarters have an informational advantage relative to other U.S. investors, suggesting that information asymmetries matter even for U.S. domestic investors.

and trading costs, which could provide new insights into the asset allocation and security selection abilities of foreign institutional investors (Wermers 2006).

Using a large sample of 215,123 firm-quarter observations over the 1990 to 2007 period, we find that the presence of foreign investors in the U.S. stock market has increased substantially over the past two decades. While foreign institutional investors held only 0.5% of total equity ownership in the U.S. in 1990, by 2007 foreign ownership had increased to almost 6.2%, accounting for approximately 10% of total institutional ownership. We also find that foreign institutional investors prefer low information asymmetry stocks more than matching domestic institutional investors and this preference for low information asymmetry stocks is particularly strong among foreign institutional investors from countries with high LOF. These results suggest that foreign investors who face high LOF costs self-select into stocks with low information asymmetry to reduce the costs associated with international equity investments.

More importantly, we find that the change in foreign institutional ownership is significantly negatively related to future returns while the change in domestic institutional ownership is not. We also find that the negative relation between the change in foreign institutional ownership and future returns is particularly evident when foreign investors are from weak investor protection countries, countries whose accounting standards differ significantly from those of the U.S., geographically remote countries, and non-English speaking countries. These findings support Bell, Filatotchev, and Rasheed (2012), who argue that institutional distance, information asymmetry, unfamiliarity, and cultural differences are important sources of the liabilities that foreign institutions face in host country stock markets. Moreover, the negative relation between the change in foreign institutional ownership and future returns is particularly strong for stocks

with greater information asymmetries, further supporting the LOF view of foreign investors in host country stock markets.

Our study contributes to the literature in several ways. First, we extend the literature on LOF (Demirbag, Tatoglu, and Glaister 2010; Qian, Li, Li, and Qian 2008) beyond the product market domain by documenting the existence of LOF in host country stock markets and identifying the main sources of LOF in these markets. Second, we extend the literature on the investment behavior of foreign investors and their performance (Grinblatt and Keloharju 2001; Choe, Kho, and Stulz 2005) by showing that the ability of foreign institutions to predict stock returns is inferior to that of domestic institutions. Unlike other studies (e.g., Shukla and van Inwegen 1995), we use firm-level dataset of foreign portfolio equity holdings in the U.S. to examine the stock-picking ability of foreign institutional investors. Finally, our study is closely related to prior literature examining the stock-picking abilities of institutional investors (Bushee 1998; Yan and Zhang 2009; Baik, Kang, and Kim 2010) and contributes to the ongoing debate over whether institutional investors have an advantage in stock investments.

The remainder of this paper is organized as follows. Section II reviews the literature and presents testable hypotheses. Section III discusses the data and provides summary statistics. In Section IV we provide empirical evidence on the determinants of foreign and domestic institutional ownership. In Section V we investigate the relation between the levels of and changes in foreign and domestic institutional ownership and future stock returns. Section VI presents results from the tests of sources of LOF cost and Section VII provides results from robustness tests. Finally, we present a summary and concluding remarks in Section VIII.

## II. Main Hypotheses

In this section, we develop the hypotheses regarding how the liabilities faced by foreign investors in the U.S. stock market and the main sources of these liabilities affect their return forecasting ability in that market. The literature on LOF posits that foreign institutions incur additional costs in collecting value-relevant information about local firms due to their unfamiliarity with the local environment and their lack of knowledge about host country capital markets (Kindleberger 1969; Hymer 1976). Compared with domestic institutions, foreign institutions are also likely to face more liabilities associated with their ability to acquire or process information about firms in the host country due to language barriers and lack of knowledge about host country accounting systems. For example, Grinblatt and Keloharju (2001) show that language barriers can adversely affect communication between foreign investors and firm management, and Bradshaw, Bushee, and Miller (2004) and Khurana and Michas (2011) find that foreign investors' ability to assess stock prospects is limited due to their lack of knowledge about accounting systems in the host country. As a result of these LOF costs faced by foreign institutions in the host country stock markets, foreign institutions are at a disadvantage and likely have reduced stock-picking and return forecasting abilities. This leads to our first hypothesis on the LOF view of foreign institutional investors in host country stock markets:

*H1: Foreign institutions' return forecasting ability is lower than that of domestic institutions.*

Next, we predict that the return forecasting power of foreign institutional investors depends on the extent of LOF inherent in their home country-specific characteristics. Following Bell, Filatotchev, and Rasheed (2012), we use institutional distance, information asymmetry,

unfamiliarity, and cultural differences as the main sources of liabilities faced by foreign institutions.

Since it is difficult for foreign investors to undertake profitable international equity investments in an unfamiliar and new legal environment, the difference in legal rules can constrain foreign investors' stock picking ability and performance. Consistent with this view, Chan, Covrig, and Ng (2009) show that differences in legal frameworks concerning accounting systems and investor protection affect stock holdings of foreign institutional investors. La Porta, Lopez-de-Silanes, Shleifer, and Vishny (LLSV 1997, 1998) also show that differences in legal system supporting investor protection explain differences in capital market regulations and development, suggesting that differences in legal system are an important source of the LOF costs faced by foreign investors. Accounting literature further suggests that GAAP rules can be a source of LOF in host country stock markets. For example, Bradshaw, Bushee, and Miller (2004) show that U.S. institutional investors prefer foreign firms with accounting rules that conform more closely to U.S. GAAP. These studies suggest that differences in legal environment and accounting rules make it difficult for foreign institutions to properly evaluate firm prospects, and thus foreign institutions from countries with weak investor protection or from countries with different accounting rules compared with the U.S. are more likely to suffer from LOF in the U.S. stock market. Accordingly, we use legal rules pertaining to investor protection and Generally Accepted Accounting Principles (GAAP) in foreign investors' home country to measure the institutional distance between home and host countries. Detailed definitions for these variables are provided in the appendix.

Another factor that can affect the extent of LOF is the extent of information costs that foreign investors face in host country stock markets. To the extent that the differences in disclosure and

earnings quality between home and host countries affect foreign investors' ability to interpret financial statements and forecast U.S. firms' future prospects, these differences likely affect their stock picking ability. For example, foreign investors whose countries' accounting rules are different from those of the U.S. are likely to have difficulty in correctly assessing U.S. firms' financial statements and accurately projecting their future financial prospects, which impose high information search costs on them (Hopkins et al. 2008). Also, different disclosure regulations and infrastructures in the U.S. may put foreign investors at a disadvantage in efficiently using information at a low cost (Ferreira and Matos 2008). As measures of differences in disclosure quality and earnings quality across countries, we use the index created by examining and rating the annual reports of the companies of the corresponding country and the earnings quality score estimated by Leuz, Nanda, and Wysocki (2003), respectively.

A third factor likely to contribute to the degree of LOF in stock markets is unfamiliarity. Previous studies suggest that geographically proximate foreign institutions incur smaller unfamiliarity costs than remote foreign institutions (Chan, Covrig, and Ng 2009; Coval and Moskowitz 1999; Ivkovic and Weisbenner 2005; Kang and Stulz 1997).[4] A foreign country's international trading exposure and experience may also affect investors' unfamiliarity costs. In particular, institutional investors from countries with more international trading exposure and experience are likely to face smaller unfamiliarity costs than those from countries with less international trading exposure and experience. Because a heavy export country presumably has

[4] It is possible that information search costs do not necessarily increase with distance due to advances in information technology. However, prior studies suggest that the information advantages associated with distance can still exist even in the presence of advances in information technology. For example, geographically proximate investors are more likely to have *informal* access to information about local firms, through conversations with employees, managers, suppliers, and customers. They can also visit geographically proximate firms and meet CEOs of these firms face-to-face at lower cost. It is also possible that compared to remote investors, investors located near firms expend less time collecting information about their firms since they are on-the-spot. This value-relevant *private* information about the firm allows local investors to make informed trades.

better knowledge about other foreign countries as well as stronger connections with them, the extent of a country's exports may be a good proxy for institutional investors' international trading exposure and experience (Kang and Stulz 1997). Thus, we measure foreign institutions' unfamiliarity with host country stock markets using the physical distance between their home country and the host country and the home country's exports to other countries.

A final factor likely to affect the degree of LOF in stock markets is cultural differences. Cultural differences can make it hard for foreign investors to understand business practices and corporate cultures in the host country, adversely affecting their ability to select stocks (Beugelsdijk and Frijns 2010). As measures of cultural differences between home and host countries, we use the cultural distance scores suggested by Kogut and Singh (1988) and a dummy variable indicating whether the primary language of the foreign investor's home country is English (Grinblatt and Keloharju 2001).

We use these eight LOF variables to measure four types of LOF costs. However, since these variables tend to be highly correlated with each other, including all of them in the same regression can create the multicollinearity problem. To avoid this problem, we create the single *Composite LOF Factor* using principal components analysis. We use this *Composite LOF Factor* to capture the general level of LOF in host country stock markets. The arguments above on country-specific LOF factors lead to the following hypothesis:

*H2: Foreign institutions' return forecasting ability is lower when they are from countries with a greater degree of LOF.*

The LOF view of foreign institutions in host country stock markets also suggests that the adverse effects of country-specific LOF factors on foreign institutions' return forecasting ability differ across stocks with different levels of information asymmetry. To the extent that foreign institutions face LOF in international stock markets and their ability to obtain value-relevant private information about a stock is particularly low for firms with high information asymmetry, the adverse effect of LOF costs on their return forecasting ability will be particularly pronounced for firms with high information asymmetry. We therefore expect the negative effects of country-specific LOF factors on foreign institutions' return forecasting ability to be more evident for stocks with high information asymmetry. Following prior literature, we measure firm-specific information asymmetry using size, return volatility, analyst forecast dispersion, and R&D intensity (Ivković and Weisbenner 2005; Baik, Kang, and Kim 2010). Using principal components analysis, we also create a single information asymmetry factor. Information asymmetry arguments at the security level lead to our third hypothesis:

*H3: The negative effects of country-specific LOF factors on foreign institutions' return forecasting ability are particularly strong when foreign institutions invest in stocks with greater information asymmetry.*

Finally, we consider a fund-specific characteristic and examine whether institutions' ability to predict returns differs between foreign hedge funds and non-hedge funds. Previous studies show that domestic hedge funds in the U.S. are better able to select undervalued stocks than other types of institutions, because they have more resources and better access to expertise (Brown, Goetzmann, and Ibbotson 1999; Brunnermeier and Nagel 2004). If foreign hedge funds

possess superior ability to choose stocks and this advantage allows them to reduce LOF costs, we expect foreign hedge funds to face less LOF in stock markets than foreign non-hedge funds. Accordingly, we expect that the return forecasting ability of foreign hedge funds is better than that of foreign non-hedge funds. This argument leads to our final hypothesis:

*H4: Foreign institutions' poor return forecasting ability is less pronounced for foreign hedge funds than foreign non-hedge funds.*

## III. Data and Summary Statistics

### A. Data

Our initial sample comprises all firm-quarters over the period April 1, 1990 to December 31, 2007 with institutional ownership from CDA/Spectrum Institutional (13F) Holdings, which are based on the SEC's Form 13F.[5]

We match sample firms covered in CDA/Spectrum with firms covered in Compact Disclosure to obtain the locations of firm headquarters. Since we focus on tests of the ability of foreign institutional investors in the U.S. stock market to predict returns, we exclude cases in which the firms are not located in the U.S. Information on the location of institutional investors' headquarters comes from Nelson's Directory of Investment Managers, Moody's Bank and Finance Manual, and SEC filings. We classify investors whose headquarters are located outside the U.S. as foreign investors.

[5] According to the SEC, foreign institutions are required to file Form 13F if they (1) use any means or instrumentality of U.S. interstate commerce in the course of their business, and (2) exercise investment discretion over $100 million or more in Section 13(f) securities. Since foreign investors have no way to buy U.S. stocks without using any means or instrumentality of U.S. interstate commerce, 13F filing requirements are likely to be equally binding for both foreign and domestic institutional investors. We thank an anonymous staff person at the SEC for the discussion on 13F filing requirements by foreign institutional investors.

Previous studies use the fund manager number (Id key = MGRNO) in CDA/Spectrum Institutional (13F) Holdings as the institution identifier. We notice, however, that the fund manager number is reassigned to a different institutional investor if the assigned investor disappears. To identify cases in which the same fund manager number is assigned to different institutional investors and to fully use them in the analysis, we track fund manager numbers and name changes for all institutional investors during our sample period. We identify 257 foreign fund managers in the 13F during the sample period. A firm's stock return and financial data are obtained from the Center for Research in Securities Prices (CRSP) and COMPUSTAT, respectively. Finally, we obtain information on analyst following from I/B/E/S. Our final full sample comprises 215,123 firm-quarters.

B. Descriptive Statistics

To examine how foreign institutional ownership in the U.S. has changed over time, in Figure 1 we plot the mean proportion of the market value of equity held by foreign (in Panel A) and domestic (in Panel B) institutional investors from 1990 to 2007, calculated using firm-level data. We obtain information on each U.S. firm's stock price and total shares outstanding from COMPUSTAT. Total US market value is the sum of the market value of equity (stock price times number of shares outstanding) of all firms covered in COMPUSTAT. We set foreign institutional ownership to zero for stocks in which foreign fund managers are not available. The results in Figure 1 show that during our sample period, the mean fraction of the market value of equity held by foreign institutional investors has increased from less than 1% to about 8% (Panel A), while the mean fraction of the market value of equity held by domestic institutional investors has not changed much at around 45% (Panel B). These results indicate that during our sample

period, foreign institutional ownership in the U.S. grew much faster than domestic institutional ownership and its increase is not due to the general increasing trend in overall institutional ownership.

As an alternative way of measuring the time-series pattern of foreign institutional ownership, we compute ownership by dividing the number of shares held by foreign institutional investors by total shares outstanding at the end of June of each year. The results are reported in Panel A of Table 1. Similar to Panel A of Figure 1, we find that foreign institutional ownership grew substantially during our sample period. We also find that the mean fraction of the market value of equity held by foreign institutional investors reported in Panel A of Figure 1 is always greater than the ownership percentage held by foreign institutional investors reported in Panel A of Table 1, indicating that foreign institutional investors invest primarily in larger firms.

Panel B of Table 1 shows the distribution of the number of foreign institutions by country. The U.K. accounts for 42.4% of the sample, followed by Canada (29.2%), the Netherlands (5.4%), Japan (5.1%), France (4.3%), and Switzerland (3.9%).

Panel C of Table 1 reports the types of foreign institutions by country. About 87.2% of the foreign institutions are classified as money managers such as mutual funds and investment advisors, while only 7.4% and 5.4% of the foreign institutions are banks and insurance companies, respectively. We do not observe any systematic differences in the types of institutional investors across the countries in the sample.

Table 2 provides descriptive statistics on foreign and domestic institutional ownership, future stock returns, country-specific LOF characteristics, and other firm characteristics. We report the time-series mean, median, standard deviation, first quartile, and third quartile of the quarterly cross-sectional average of firm-specific variables. All firm-specific variables are estimated at the

same quarter-end unless noted otherwise. To minimize outlier problems, we trim the samples by excluding observations at the top and bottom one percentile of the variables. To avoid issues with respect to penny stocks, stocks with a price below one dollar are omitted from the final sample. For country-specific LOF characteristics, we report the corresponding numbers of their annual cross-sectional average. Detailed definitions for firm- and LOF-specific variables are provided in the appendix.

Consistent with the results reported in Panel A of Table 1, we find that the mean (median) equity ownership held by domestic institutional investors during our sample period is 37.5% (34.3%) of outstanding shares, while the corresponding equity ownership held by foreign institutional investors is 2.62% (2.48%). Since the average market value of stocks held by foreign institutional investors is around $97.2 million, foreign institutions hold about 4.5% of the average sample firm's market capitalization (compared with 2.6% of the outstanding shares), suggesting that foreign investors invest in larger firms.

Table 3 reports correlations among country-specific LOF factors. *GAAP Difference* and *Investor Protection*, which measure the country's institutional distance, are highly correlated (Spearman correlation coefficient of -0.6285), suggesting that each variable captures similar characteristics of the country's institutional distance. Similarly, we find high correlations between the two information cost variables (*Disclosure Quality* and *Earnings Quality*) and between the two cultural difference variables (*Cultural Distance* and *Non-English*). However, *Export* and *Distance*, which measure unfamiliarity costs, are not significantly correlated with each other.[6]

[6] Untabulated analysis for final communality estimates shows that *Earnings Quality* plays the most important role in creating *Composite LOF Factor* (0.57), followed by *Disclosure Quality* (0.54), *Investor Protection* (0.51), *English* (0.45), *GAAP Difference* (0.37), *Export* (0.26), and *Cultural Distance* (0.04). *Distance* (0.01) plays the least role in

## IV. Determinants of Domestic and Foreign Institutional Ownership

To examine whether the determinants of foreign institutional holdings differ from those of domestic institutional holdings, we estimate cross-sectional regressions of institutional ownership on firm characteristics separately for foreign and domestic institutional ownership. To draw meaningful inferences about the determinants of foreign institutional holdings, we use two types of domestic institutional ownership as comparison groups; domestic institutional ownership held by all domestic institutions and matching domestic institutional ownership. We use a propensity score matching approach to obtain matching domestic institutions. We use fund size, type, age, and churn rate to match institutions since prior studies show that these variables affect investors' portfolio decisions (Kacperczyk, Sialm, and Zheng 2005). This matching procedure ensures that institution characteristics are relatively homogenous across foreign and matching domestic institutional investors.

Following Falkenstein (1996) and Gompers and Metrick (2001), we include 10 stock characteristics as determinants of institutional ownership: *Market-to-Book*, *Size*, *Return Volatility*, *Turnover*, *Price*, *S&P 500*, cumulative market-adjusted return for the preceding 6 months ($MRET_{t-6,\,t}$), cumulative market-adjusted return for the penultimate 6 months ($MRET_{t-12,\,t-7}$), *Age*, and *Dividend Yield*. In addition, we include *R&D* and *Accruals* as explanatory variables, because previous research shows that R&D intensity (Aghion, van Reenen, and Zingales 2009) and earnings quality (Rajgopal, Venkatachalam, and Jiambalvo 2002) are important determinants

creating the *Composite LOF Factor*. We also examine the correlations among firm-specific characteristics and find that the change in domestic institutional ownership ($\Delta$ *Domestic Institutional Ownership*$_t$) is not significantly related to future returns ($RET_{t,t+3}$), while the change in foreign institutional ownership ($\Delta$ *Foreign Institutional Ownership*$_t$) is significantly negatively related to future returns ($p$-value<0.01). These results suggest that foreign institutional investors have poor stock-picking ability compared to domestic institutional investors in general. The correlations between other firm-specific control variables and future returns are largely consistent with those in prior research (Gompers and Metrick 2001).

of institutional ownership. We also include *Illiquidity* as an inverse measure of a stock's liquidity since stock liquidity can be an important determinant of institutional holdings. *Illiquidity* is computed as the quarter *t-1* average daily absolute return divided by the daily dollar trading volume (Amihud 2002).[7]

Table 4 shows the results. The reported *t*-statistics in parentheses are the average time-series *t*-statistics for coefficients using the Fama-MacBeth (1973) method. Since foreign and domestic institutional ownership are significantly different in size (i.e., as shown in Table 2, while the mean domestic institutional ownership is 37.5%, the mean foreign institutional ownership is only 2.62%), all ownership variables in the analysis are standardized to have zero mean and unit variance to make our coefficient estimates comparable (Hirshleifer, Hou, and Teoh 2009). Column (1) shows the results using domestic institutional ownership as the dependent variable and column (2) shows the results using foreign institutional ownership as the dependent variable. We find that the coefficient estimates on all explanatory variables are significant in both regressions except for $MRET_{t-6,\ t}$ and $MRET_{t-12,\ t-7}$ in column (1). The coefficient estimates on *Size*, *Turnover*, *Price*, and *Age* are positive and significant in both regressions. In contrast, the coefficient estimates on *Market-to-Book*, *Return Volatility*, and *Accruals* are negative and significant in both regressions. These results suggest that institutional investors, irrespective of nationality, prefer stocks with low information asymmetry. The negative coefficient on *Illiquidity* in both regressions implies that both domestic and foreign institutional investors prefer stocks with high liquidity.

[7] The LOF view of foreign investors suggests that to overcome their disadvantages and to execute profitable future trades or exit the market with minimal cost, foreign investors are likely to have a strong demand for liquidity in their international equity investments. In untabulated tests, we experiment with other alternative liquidity measures such as the inverse of the average price and the proportion of zero returns in quarter *t-1* and find that the results are similar.

Column (3) shows the results using matching domestic institutional ownership as the dependent variable. We find that the coefficient estimates on *Illiquidity*, *Size*, *Age*, and *Accruals* lose their significance. We also find that the coefficient estimates on several explanatory variables that are significant are smaller in absolute magnitude than the corresponding coefficient estimates in columns (1) and (2). For example, the coefficient estimate on *Market-to-Book* in column (3) is -0.0133, while the corresponding coefficient estimates in columns (1) and (2) are -0.0548 and -0.0292. Similarly, the coefficient estimate on *Turnover* in column (3) is 0.9637, while the corresponding coefficient estimates in columns (1) and (2) are 2.9142 and 1.2297. Overall, these results suggest that compared with matching domestic institutional investors, foreign institutional investors exhibit greater preference for stocks with high liquidity and low information asymmetry. [8]

Columns (4) and (5) show the results using ownership held by foreign institutions from countries with high and low LOF costs, respectively. We divide foreign institutions into those from countries with high and low LOF costs according to the sample median of each country's *Composite LOF Factor*. We find that foreign institutional investors' preference for stocks with low information asymmetry and high liquidity is mostly evident for foreign institutions from countries with high LOF costs. For example, the coefficient estimates on *Illiquidity* and *Return Volatility* for ownership held by foreign institutions from countries with low LOF costs are positive and significant ($p$-value<0.01), while the corresponding coefficient estimates for ownership held by foreign institutions from countries with high LOF costs are negative and

[8] However, we find that the coefficient estimate on *Return Volatility* in column (3) is significantly negative, but its magnitude is significantly smaller than that in column (2), suggesting that although both matching domestic and foreign institutions prefer high liquidity stocks, such preference is weaker for foreign institutions than matching domestic institutions. We also find that the coefficient estimate on *R&D* in column (3) is significantly smaller than that on *R&D* in column (2), suggesting that foreign institutions prefer R&D intensive firms than matching domestic institutions.

significant ($p$-value<0.01). Similarly, we find that compared with foreign investors from low LOF countries, those from high LOF countries prefer stocks with high *Turnover*, high *Price*, S&P 500 inclusion, old *Age*, high *Dividend Yield*, and low *Accruals*. However, the coefficient estimate on R&D intensity (size) in column (4) is significantly larger (smaller) than that on R&D intensity (size) in column (5), suggesting that foreign institutions from high LOF countries prefer high R&D intensive (small) firms than those from low LOF countries. Overall, these results largely suggest that foreign institutional investors from countries with a greater degree of LOF self-select into stocks with low information asymmetry and high liquidity to minimize the LOF costs that they face in host country stock markets.

## V. Institutional Ownership and Future Stock Returns

To examine whether foreign institutional investors face liabilities in the host country stock market, we adopt the Gompers and Metrick (2001) methodology and estimate a cross-sectional regression of one-quarter-ahead returns on lagged levels of foreign and domestic institutional ownership variables (*Foreign Institutional Ownership*$_{t-1}$ and *Domestic Institutional Ownership*$_{t-1}$) and changes in foreign and domestic institutional ownership variables (*ΔForeign Institutional Ownership*$_t$ and *ΔDomestic Institutional Ownership*$_t$). Specifically, they perform OLS regressions of future returns (one-quarter-ahead returns) on (1) the lagged level of institutional ownership in quarter *t-1* (*Institutional Ownership*$_{t-1}$) and (2) the change in institutional ownership between quarters *t-1* and *t* (*ΔInstitutional Ownership*$_t$). Gompers and Metrick (2001) argue that *ΔInstitutional ownership*$_t$ serves as a good indicator of the return predictability of institutional investors and *Institutional Ownership*$_{t-1}$ of future institutional demand. Following Gompers and

Metrick (2001), we use $\Delta Foreign\ Institutional\ Ownership_t$ as our primary measure of the return forecasting power of foreign institutional investors.

Columns (1) – (3) in Table 5 report the results. As in Table 4, the regression coefficient and its *t*-statistic are computed as the time-series average of coefficients from 71 cross-sectional regressions and their time-series *t*-statistics (Fama and MacBeth 1973). In column (1), we use foreign institutional ownership as our key independent variable, controlling for total institutional ownership and other firm characteristics. We find that the coefficient estimate on the lagged level of foreign institutional ownership is insignificant (0.0184). However, the coefficient estimate on the change in foreign institutional ownership is negative and marginally significant at the 10% level (-0.1273), indicating poor stock-picking ability of foreign institutional investors in general. This result supports the LOF view of foreign investors in host country stock markets. We also find that consistent with Gompers and Metrick (2001), the coefficient estimate on the lagged level of total institutional ownership is positive and significant, while the coefficient estimate on the change in total institutional ownership is insignificant. These findings suggest that the level of total institutional ownership predicts future stock returns and that its return predictability is driven largely by demand shocks.

In column (2), we examine the relation between domestic institutional ownership and future stock returns. Since total institutional ownership is mostly composed of domestic institutional ownership, we exclude total institutional ownership from the regression to avoid a potential multicollinearity problem.[9] The results show that the coefficient estimate on the lagged level of

[9] Untabulated tests show that when we include both total institutional ownership and domestic institutional ownership in the regression, the median Variance Inflation Factors (VIFs) in 71 quarterly regressions are 116.13 for domestic institutional ownership and 122.95 for total institutional ownership. These high values of VIFs indicate that multicollinearity can be a problem.

domestic institutional ownership is positive and significant at the 5% level (0.0126), while the coefficient estimate on the change in domestic institutional ownership is insignificant (0.0037).

In column (3), we include both foreign and domestic institutional ownership in the regression. The coefficient estimate on the lagged level of foreign institutional ownership is insignificant, while the coefficient estimate on the change in foreign institutional ownership is negative and marginally significant at the 10% level. Similar to the results in column (2), the coefficient estimate on the lagged level of domestic institutional ownership is positive and significant, while the coefficient estimate on the change in domestic institutional ownership is insignificant. These findings support the prediction in *H1* that foreign institutional investors face LOF costs that adversely affect their stock-picking ability in the host country stock market.

In untabulated tests, given the large number of foreign institutions from the U.K. (Canada), we examine the robustness of our findings by repeating all regressions after excluding foreign ownership involving the U.K. (Canada). We find that the results are qualitatively similar to those reported in the table.[10]

## VI. Sources of LOF Costs in International Equity Investments

### A. Country-Specific LOF Factors

Thus far, we show how LOF affects foreign institutional investors' stock-picking ability in international equity investments. In this section, we draw the sources of LOF costs from prior research and examine whether these LOF costs affect the return forecasting power of foreign institutional investors. Specifically, we decompose foreign institutional investors into those from

[10] In untabulatd tests, we split our sample period into two subperiods, 1990 to 2000 and 2001 to 2007, and separately reestimate the regressions. We find that the negative relation between the change in foreign institutional ownership and future returns exists in both subperiods, suggesting that our results are not time-specific.

countries with high and low LOF costs according to the sample median of each of the eight country-specific variables discussed in Section II, and examine whether the relation between the change in foreign ownership and future returns is different between the two groups.[11] To the extent that the negative relation between the change in foreign institutional ownership and future returns is attributable to LOF, we expect this negative relation to be more pronounced for foreign institutional investors from countries with high LOF costs.

Columns (4) through (12) of Table 5 show the results using each of LOF factors. The results are consistent with our expectation. In column (4), we decompose *ΔForeign Institutional Ownership*$_t$ according to foreign countries' GAAP differences. We find that the coefficient estimate on the change in ownership by foreign institutions from high LOF countries (*ΔHigh LOF Foreign Inst. Ownership*$_t$) is negative and significant at the 5% level, while the coefficient estimate on the change in ownership by foreign institutions from low LOF countries (*ΔLow LOF Foreign Inst. Ownership*$_t$) is insignificant. This difference in coefficient estimates is significant at the 10% level, suggesting that the stock-picking ability of foreign institutional investors is lower when they are from countries whose GAAP is different from U.S. GAAP. We find similar results for other country-specific LOF factors. In the last column, we use the *Composite LOF* factor to decompose *ΔForeign Institutional Ownership*$_t$ into *ΔHigh LOF Foreign Inst. Ownership*$_t$ and *ΔLow LOF Foreign Inst. Ownership*$_t$. We find that the coefficient estimate on *ΔHigh LOF Foreign Inst. Ownership*$_t$ is negative and significant at the 5% level while the coefficient estimate on *ΔLow LOF Foreign Inst. Ownership*$_t$ is positive and insignificant,

[11] An exception is the *Non-English* indicator variable that equals one if the foreign institutions are from countries whose primary language is not English and zero otherwise.

suggesting that foreign institutional investors' stock-picking ability is poorer when they are from countries with high LOF. Overall, these results support *H2*.[12]

B. Interaction of Country-Specific LOF Factors with Stocks' Information Asymmetry Measures

In this subsection, we examine whether the effect of LOF on the return forecasting ability of foreign institutions differs across stocks with different levels of information asymmetry. To the extent that foreign institutions face LOF in international stock markets and the adverse effect of LOF on their return predictability is particularly severe for stocks with high information asymmetry, we expect the results in the last column of Table 5 to be more pronounced for stocks with higher information asymmetry than those with lower information asymmetry.

To test this prediction, we first perform principal components analysis among four information asymmetry variables (firm size, return volatility, analyst forecast dispersion, and R&D intensity) and create a single information asymmetry factor to avoid multicollinearity or attenuation bias problems.[13] We then divide our sample firms into high and low information asymmetry firms according to the sample median of this information asymmetry factor and reestimate the last regression in Table 5 separately for the two subgroups.

Table 6 presents the results. As expected, the coefficient estimate on *ΔHigh LOF Foreign Inst. Ownership*$_t$ is negative and significant for high information asymmetry firms (column (1)), but insignificant for low information asymmetry firms (column (2)). The difference in these two

[12] In untabulated tests, we experiment with an alternative measure of country-specific LOF costs, the proportion of firms from a foreign country that are cross-listed in the U.S. (i.e., the ratio of the number of cross-listed firms in the U.S. to the total number of publicly listed firms in that country during our sample period). We find that this listing ratio is negatively related to our LOF measures. We also find that foreign institutional investors who are from countries with a lower listing ratio have inferior stock-picking ability than those who are from countries with a higher listing ratio.

[13] Untabulated analysis for final communality estimates shows that *Return Volatility* plays the most important role in creating *Composite Information Asymmetry Factor* (0.35), followed by *Size* (0.21), *R&D* (0.19), and *Analyst Forecast Dispersion* (0.14).

coefficient estimates is statistically significant. Thus, foreign institutional investors from countries with a high LOF underperform when they trade stocks with high information asymmetry, supporting *H3*.

These results, together with those in Table 4, suggest that when foreign investors face high LOFs, they have strong incentives to take necessary actions to reduce the adverse effect of LOF costs on stock investments in the host country such as holding stocks with low information asymmetry. However, when foreign institutional investors from countries with high LOF costs decide to invest in stocks with high information asymmetry, they are likely to underperform because high LOF costs constrain their stock-picking ability and performance.

C. Foreign Hedge Funds versus Non-Hedge Funds

In this subsection, we examine whether the return forecasting power of foreign institutional investors differs between foreign hedge funds and non-hedge funds. Untabulated analysis shows that the negative relation between the change in foreign institutional ownership and future returns reported in Table 5 is largely driven by foreign non-hedge funds. Specifically, we find that that the change in foreign non-hedge fund ownership is significantly negatively related to future returns while the relation is negative but statistically insignificant for foreign hedge fund ownership. We also find that for the subsample of firms with high information asymmetry, the coefficient estimate on the interaction term between the change in foreign non-hedge funds ownership and the high *Composite LOF* indicator is negative and significant while that on the interaction term between the change in foreign hedge funds ownership and the high *Composite LOF* indicator is insignificant. For the subsample of firms with low information asymmetry, the coefficient estimates on both interaction terms are not significant. These results suggest that non-

hedge fund investors who are from countries with high LOF costs perform worse when they purchase stocks with high information asymmetry.

D. Portfolio Analysis

Finally, to gauge the economic significance of the effect of LOF on the return predictability of foreign institutional investors, we perform portfolio analyses. The results are reported in Table 7. Specifically, in each quarter from April 1, 1996 to December 31, 2007, we sort stocks into deciles on the basis of the change in domestic and foreign institutional ownership, and then compute annualized one-quarter-ahead value-weighted returns on the decile portfolios. Similarly, we repeat this sorting using ownership held by foreign institutions from countries with high and low LOF costs.[14] We then form a zero-cost investment, a hedge portfolio strategy, which takes a long position in portfolio D10 (the decile portfolio with the largest ownership increase) and a short position in portfolio D1 (the decile portfolio with the largest ownership decrease), and compute the average return on the hedge portfolio (D10 – D1).

When stocks are sorted by the change in domestic institutional ownership (column (4)), the risk-adjusted return (Daniel et al., 1997) for stocks in the highest decile (stocks most heavily purchased by institutional investors) does not differ significantly from that for stocks in the lowest decile (stocks most heavily sold by institutional investors). However, the risk-adjusted hedge portfolio return calculated from the sort based on the change in foreign institutional

[14] As shown in Figure 1, foreign institutional ownership was relatively small and stable in the early years of our sample period, particularly during the 1990-1995 subperiod. Since this scarcity and stability of foreign ownership distort our decile portfolios, we examine portfolio returns after omitting the 1990-1995 subperiod. In untabulated tests, we reestimate the regressions in Tables 5 using the 1996-2007 subperiod and find that our key results for the negative (positive) relation between the change in foreign institutional ownership (level of domestic institutional ownership) and future returns does not change.

ownership generates a significant -2.18% per year (column (1)), further supporting the prediction in *H1* that foreign investors have poor stock-picking ability.

When we further partition foreign institutional ownership into high and low LOF subgroups, we find that the negative hedge portfolio returns of foreign ownership are mainly driven by high LOF foreign ownership. The risk-adjusted hedge portfolio return based on the change in ownership held by foreign institutions from countries with high LOF costs is a significant -2.85% per year (column (2)). In contrast, we do not observe any significant hedge portfolio return when the return is calculated from the sort based on the change in ownership held by foreign institutions from countries with low LOF costs (column (3)). The difference in risk-adjusted hedge portfolio returns between high and low LOF groups is statistically significant (*p*-value=0.06). These results corroborate those reported in Table 5, supporting the prediction in *H2* that the ability of foreign institutions to predict future returns is lower when they are from countries with a greater degree of LOF.

## VII. Additional Tests

To check the robustness of the results, we conduct several additional tests. First, we examine whether the lower stock-picking ability of foreign institutional investors is mainly driven by a few worst-performing foreign institutional investors or a subset of foreign institutional investors with specific fund characteristics. Specifically, we repeat the analyses after excluding foreign institutional investors in the bottom decile of past quarter performance and find almost identical results to those reported in the paper. We also decompose foreign institutional investors into two groups according to the sample median of each fund characteristic (high versus low churn rates, young versus old funds, and large versus small fund size) and find that the stock-picking ability

of foreign institutional investors is not different between the two groups. Next, we examine whether our results are robust when using longer time horizons such as two- and three-quarter-ahead returns. We find that the negative relation between the change in foreign institutional ownership and future returns becomes statistically insignificant when we use two- or three-quarter-ahead returns as the dependent variable, suggesting that foreign institutions' disadvantages in the U.S. stock market are short-lived. However, to the extent that SEC Form 13F filings are updated at the end of every quarter and foreign intuitions are able to rebalance their stock holdings every quarter (particularly stocks with large losses), the results may also suggest that long-term returns such as two- and three-quarter-ahead returns can be a noisy measure of institutional investors' return forecasting ability.[15]

As an additional test, using a unique setting for Canadian institutional investors (i.e., Canadian institutions share almost similar characteristics as U.S. domestic institutions), we explore the variation in their LOF costs in a given country. We examine how distance affects the relation between the change in Canadian institutional ownership and future returns by including a remote indicator (takes the value of one if Canadian institutional investors' physical distance from the headquarters of their U.S. portfolio firms is in the top quartile of the sample and zero otherwise) and its interaction with the change in Canadian institutional ownership in the regression. We find that the coefficient estimate on the interaction term is negative and

[15] To the extent that SEC Form 13F filings are updated at the end of every quarter and foreign intuitions are able to rebalance their stock holdings every quarter (particularly stocks with large losses), the results may suggest that long-term returns such as two- and three-quarter-ahead returns are a noisy measure of institutional investors' return forecasting ability. Because of this potential problem, previous studies including Gompers and Metric (2001), Yan and Zhang (2009), and Baik, Kang, and Kim (2010) use one-quarter-ahead returns as their key measure of institutions' return forecasting ability. There is also another potential problem in using quarterly holding data. SEC's Form 13F requires disclosure of the number of shares as of the end of the calendar quarter for which the report is filed. As such, the data on institutional holdings will only capture positions at quarter-end. Therefore, the periodicity of the data may obscure the true performance of institutions.

significant at the 5% level, suggesting that the stock-picking ability is lower for remote Canadian institutions than geographically proximate Canadian institutions. Finally, to control for foreign investors' risk-reducing diversification benefits, we compute benchmark-adjusted returns for nine countries (U.K., Canada, Netherlands, Japan, France, Switzerland, Australia, Hong Kong, and Sweden) available in Datastream International by subtracting foreign institutions' equally-weighted index returns in their home country from one-quarter-ahead returns and regress these benchmark-adjusted returns on the lagged level of and change in equity ownership held by foreign institutional investors. We find that the coefficient estimate on the change in foreign institutional ownership is negative and significant at the 1% level, suggesting that our results are robust to controlling for risk-reducing diversification benefits.

## VIII. Summary and Conclusion

In this paper we examine whether foreign investors face the LOF in the host country stock market by investigating the return predictability of foreign and domestic institutional ownership in the U.S. stock market. We find that while both foreign and domestic institutional investors prefer firms with low information asymmetry, the preference for lower information asymmetry stocks is stronger for foreign institutional investors, particularly when they are from countries with high LOF. Supporting the LOF view of foreign investors in host country stock markets, we find a negative and significant relation between the change in foreign ownership and future returns, but no such relation between the change in domestic ownership and future returns.

Moreover, the negative relation between the change in foreign institutional ownership and future returns is particularly pronounced when foreign investors face a greater degree of LOF in the U.S. stock market, for instance, when they are from countries with higher institutional

distance, information asymmetry, unfamiliarity, and cultural differences. The negative effect of country-specific LOF factors on the return forecasting power of foreign institutional investors is more evident when they trade stocks with higher information asymmetry. Overall, these findings suggest that foreign institutional investors face significant LOF costs in the U.S. stock market, resulting in their poorer ability to forecast returns.

Several caveats are in order. First, to examine LOF costs in international equity investments, we use only the shares of the U.S. firms that foreign institutional investors hold, that is, we do not include other shares held by these investors in non-U.S. stock markets, due to lack of data. To the extent that other non-U.S. stock markets have different characteristics and regulations, our results may not be generalizable to these markets. Second, because of data limitations, we examine the ability of foreign institutions to predict returns without considering their intra-quarter trading. To the extent that foreign investors have high turnover in certain stocks, particularly during the latter part of our sample period, our analysis may not fully capture their short-term trading. Finally, it is possible that using their resources and trading skills, some foreign institutions are able to employ complex trading strategies that our equity holding data on 13F filings cannot capture. This data limitation may overstate the information disadvantages of foreign institutional investors in the U.S. stock market. An analysis of the importance of these issues represents a valuable area for future research.

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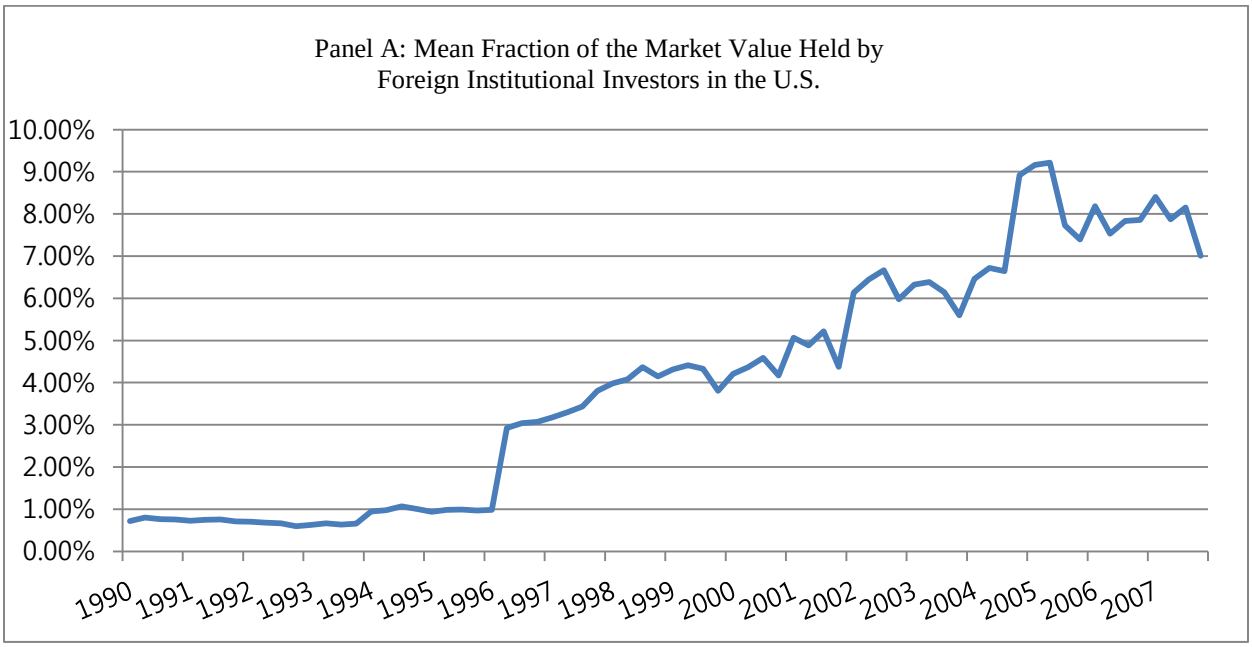


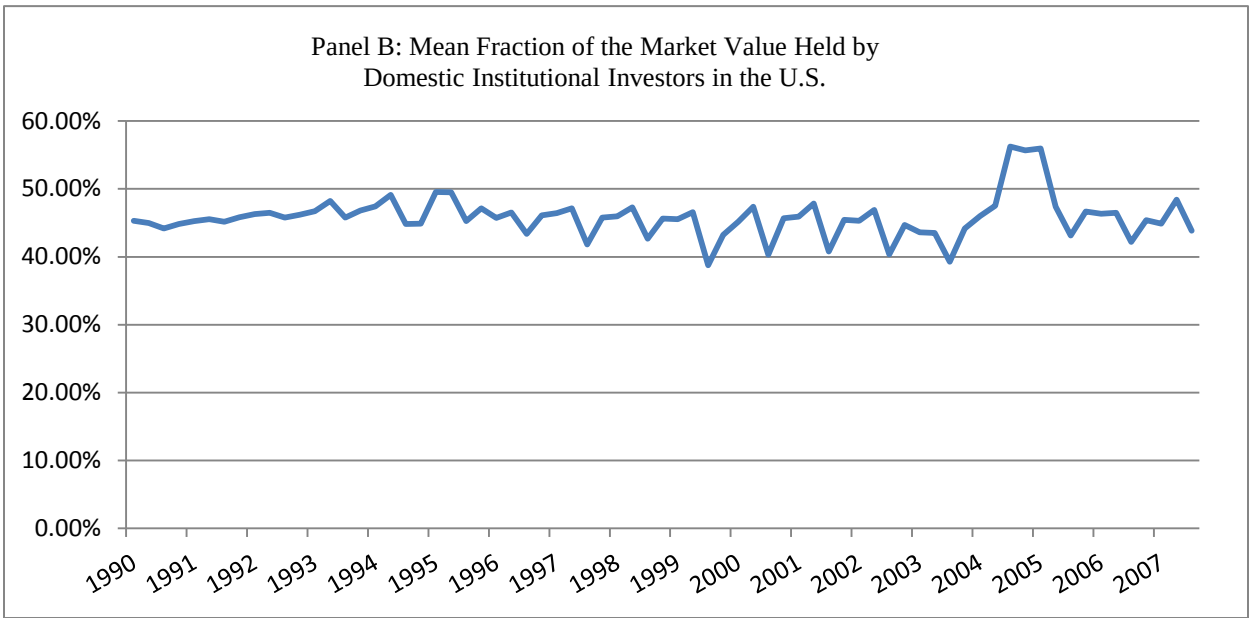


**Figure 1. Mean Fraction of the Market Value of Equity Held by Foreign and Domestic Institutions in the U.S. over Time**

This figure reports the mean fraction of the market value of equity held by foreign (Panel A) and domestic (Panel B) institutions in the U.S. over time. The fraction of the market value of equity held by foreign (domestic) institutions is computed as the ratio of a firm's market value of equity held by foreign (domestic) institutions to its total market value of equity. The sample consists of firm-quarters with institutional ownership from the CDA/Spectrum Institutional (13F) Holdings from April 1, 1990 to December 31, 2007 for which the locations of the firm and institution headquarters are available. Foreign (domestic) institutions are those institutional investors whose headquarters are located outside (in) the U.S.

**Table 1**
**Descriptive Statistics of Foreign and Domestic Institutional Ownership at the Firm Level by Year**

This table summarizes foreign and domestic institutional ownership at the firm level by year. The sample consists of firm-quarters with institutional ownership from CDA/Spectrum Institutional (13F) Holdings from April 1, 1990 to December 31, 2007 for which the locations of firm and institution headquarters are available. Foreign (domestic) institutional investors are institutional investors whose headquarters are located outside (in) the U.S. Foreign (domestic) institutional ownership is computed as the number of shares held by foreign (domestic) institutional investors divided by total shares outstanding.

Panel A: Foreign and domestic institutional ownership by year (%)

| Year | Foreign institutional ownership | Domestic institutional ownership |
|---|---|---|
| June 90 | 0.51 | 30.4 |
| June 91 | 0.51 | 31.8 |
| June 92 | 0.53 | 33.6 |
| June 93 | 0.43 | 33.7 |
| June 94 | 0.68 | 33.1 |
| June 95 | 0.71 | 34.0 |
| June 96 | 2.39 | 33.1 |
| June 97 | 2.13 | 34.0 |
| June 98 | 2.57 | 34.6 |
| June 99 | 2.46 | 34.1 |
| June 00 | 2.33 | 32.9 |
| June 01 | 2.56 | 35.1 |
| June 02 | 3.63 | 38.7 |
| June 03 | 4.06 | 40.2 |
| June 04 | 4.55 | 45.5 |
| June 05 | 5.31 | 48.1 |
| June 06 | 5.52 | 49.3 |
| June 07 | 6.16 | 51.0 |
| 1990-2007 | 2.62 | 37.5 |

Panel B: Distribution of foreign funds in the U.S. stock market by country

| Country | Number of funds | Percentage |
|---|---|---|
| United Kingdom | 109 | 42.4 |
| Canada | 75 | 29.2 |
| Netherlands | 14 | 5.4 |
| Japan | 13 | 5.1 |
| France | 11 | 4.3 |
| Switzerland | 10 | 3.9 |
| Australia | 3 | 1.2 |
| Hong Kong | 3 | 1.2 |
| Sweden | 3 | 1.2 |
| Others | 16 | 6.1 |
| Total | 257 | 100.0 |

Panel C: Types of foreign funds in the U.S. stock market by country

| Country | Banks | Insurance | Money Managers (Mutual funds, investment advisors, etc.) | Total |
|---|---|---|---|---|
| United Kingdom | 6 | 2 | 101 | 109 |
| Canada | 2 | 6 | 67 | 75 |
| Netherlands | 1 | 0 | 13 | 14 |
| Japan | 1 | 4 | 8 | 13 |
| France | 0 | 0 | 11 | 11 |
| Switzerland | 4 | 2 | 4 | 10 |
| Australia | 0 | 0 | 3 | 3 |
| Hong Kong | 1 | 0 | 2 | 3 |
| Sweden | 0 | 0 | 3 | 3 |
| Others | 4 | 0 | 12 | 16 |
| Total | 19 | 14 | 224 | 257 |

**Table 2**
**Descriptive Statistics**

This table provides descriptive statistics for the quarterly cross-sectional averages for institutional ownership, future stock returns, and other firm characteristics and those for country-specific liability of foreignness (LOF) factors. The full sample consists of 215,123 firm-quarters with institutional ownership from CDA/Spectrum Institutional (13F) Holdings from April 1, 1990 to December 31, 2007 for which the locations of firm and institution headquarters are available. Foreign (domestic) institutional investors are institutional investors whose headquarters are located outside (in) the U.S. The appendix provides a detailed description of the construction of the variables. All variables are estimated at the same quarter-end unless noted otherwise.

| | Number of quarters (countries) | Number of firm-quarters | Mean | Median | Std. Dev. | First Quartile | Third Quartile |
|---|---|---|---|---|---|---|---|
| **Ownership and Future Returns** | | | | | | | |
| *Total Institutional Ownership (%)* | 71 | 215,123 | 40.0 | 36.5 | 7.36 | 34.1 | 45.3 |
| *Domestic Institutional Ownership (%)* | 71 | 215,123 | 37.5 | 34.3 | 6.40 | 33.1 | 41.7 |
| *Foreign Institutional Ownership (%))* | 71 | 215,123 | 2.62 | 2.48 | 1.85 | 0.70 | 4.07 |
| $RET_{t,t+3}$ *(%)* | 71 | 215,123 | 3.17 | 2.89 | 8.97 | -2.70 | 8.52 |
| **Country-Specific LOF Factors** | | | | | | | |
| *1) Institutional Distance:* | | | | | | | |
| *GAAP Difference* | (15) | 160,165 | 8.33 | 8 | 4.24 | 6 | 10 |
| *Investor Protection* | (15) | 160,165 | 5.81 | 6.01 | 2.40 | 4.24 | 7.72 |
| *2) Information Costs:* | | | | | | | |
| *Disclosure Quality* | (15) | 160,165 | 70.27 | 69 | 6.46 | 64 | 75 |
| *Earnings Quality* | (15) | 160,165 | -13.63 | -16 | 7.01 | -20.5 | -5.8 |
| *3) Unfamiliarity Costs:* | | | | | | | |
| *Export ($billions)* | (15) | 160,165 | 113.75 | 68.99 | 100.59 | 35.05 | 162.42 |
| *Distance (kilometers)* | (15) | 160,165 | 7,642 | 6,035 | 4,228 | 5,770 | 10,856 |
| *4) Cultural Differences:* | | | | | | | |
| *Cultural Distance* | (15) | 160,165 | 1.45 | 1.63 | 1.13 | 0.32 | 2.41 |
| *Non- English* | (15) | 160,165 | 0.53 | 1 | 0.52 | 0 | 1 |
| *Composite LOF Factor* | (15) | 160,165 | 0 | -0.42 | 0.99 | -1.02 | 0.79 |
| **Other Firm Characteristics** | | | | | | | |
| *Illiquidity* | 71 | 204,102 | 0.0065 | 0.006 | 0.0027 | 0.0047 | 0.0081 |
| *Market-to-Book* | 71 | 215,123 | 2.30 | 2.30 | 0.33 | 2.08 | 2.58 |
| *Size: Market Capitalization ($mil)* | 71 | 215,123 | 2,163 | 1,603 | 1488 | 866 | 2,951 |
| *Return Volatility (%)* | 71 | 215,123 | 11.90 | 11.62 | 2.19 | 10.13 | 13.11 |
| *Turnover* $_{t-6,\,t}$*(%)* | 71 | 215,123 | 8.89 | 8.64 | 2.47 | 7.18 | 10.42 |
| *Price ($)* | 71 | 215,123 | 19.77 | 18.68 | 3.04 | 17.56 | 22.77 |
| *SP500 (dummy)* | 71 | 215,123 | 0.100 | 0.100 | 0.017 | 0.085 | 0.111 |
| $MRET_{t-6,\,t}$*(%)* | 71 | 215,123 | 5.95 | 6.82 | 11.19 | -0.90 | 12.57 |
| $MRET_{t-12,\,t-7}$*(%)* | 71 | 215,123 | 6.06 | 6.86 | 11.17 | -0.45 | 12.32 |
| *Age (months)* | 71 | 215,123 | 175.2 | 177.0 | 17.4 | 157.6 | 190.2 |
| *Dividend Yield* | 71 | 215,123 | 0.003 | 0.003 | 0.0007 | 0.003 | 0.003 |
| *R&D (%)* | 71 | 215,123 | 0.79 | 0.80 | 0.10 | 0.72 | 0.86 |
| *Accruals* | 71 | 179,003 | -0.028 | -0.025 | 0.014 | -0.041 | -0.018 |

**Table 3**
**Correlations among Country-Specific LOF Factors**

This table provides correlations among country-specific liability of foreignness (LOF) factors. Pearson (Spearman) correlation coefficients appear in the upper (lower) diagonal with two-sided p-values shown below. The appendix provides a detailed description of the construction of the variables.

| | *GAAP Difference* | *Investor Protection* | *Disclosure Quality* | *Earnings Quality* | *Export* | *Distance* | *Cultural Distance* | *Non-English* | *Composite LOF Factor* |
|---|---|---|---|---|---|---|---|---|---|
| *GAAP Difference* | | -0.5432 | -0.3843 | -0.5778 | -0.0212 | 0.0759 | -0.0439 | 0.1415 | 0.6166 |
| | | *0.0364* | *0.1573* | *0.0241* | *0.9403* | *0.7882* | *0.8767* | *0.6150* | *0.0143* |
| *Investor Protection* | -0.6285 | | 0.4150 | 0.3268 | -0.3577 | 0.2022 | 0.0277 | -0.5915 | -0.7206 |
| | *0.0121* | | *0.1240* | *0.2345* | *0.1906* | *0.4699* | *0.922* | *0.0202* | *0.0024* |
| *Disclosure Quality* | -0.5218 | 0.4249 | | 0.5741 | -0.3783 | 0.1738 | 0.0755 | -0.4094 | -0.7448 |
| | *0.0460* | *0.1144* | | *0.0252* | *0.1645* | *0.5355* | *0.7891* | *0.1296* | *0.0014* |
| *Earnings Quality* | -0.4937 | 0.2592 | 0.4371 | | -0.3715 | -0.2798 | -0.3588 | -0.2000 | -0.7668 |
| | *0.0614* | *0.3510* | *0.1033* | | *0.1728* | *0.3126* | *0.1891* | *0.4749* | *0.0009* |
| *Export* | 0.0126 | -0.0804 | -0.1997 | -0.3571 | | -0.1306 | -0.1714 | 0.3154 | 0.5186 |
| | *0.9644* | *0.7757* | *0.4756* | *0.1913* | | *0.6427* | *0.5414* | *0.2522* | *0.0476* |
| *Distance* | 0.4415 | -0.0411 | 0.1403 | -0.3607 | -0.0893 | | 0.3418 | -0.2729 | -0.0860 |
| | *0.0995* | *0.8843* | *0.6180* | *0.1866* | *0.7517* | | *0.2124* | *0.3251* | *0.7607* |
| *Cultural Distance* | 0.1243 | -0.1215 | 0.0126 | -0.4214 | -0.1214 | 0.4571 | | 0.4552 | 0.1983 |
| | *0.6589* | *0.6661* | *0.9645* | *0.1177* | *0.6664* | *0.0867* | | *0.0882* | *0.4787* |
| *Non-English* | 0.3589 | -0.6037 | -0.4829 | -0.1237 | 0.2165 | -0.0619 | 0.4639 | | 0.6781 |
| | *0.1889* | *0.0172* | *0.0683* | *0.6605* | *0.4383* | *0.8266* | *0.0815* | | *0.0055* |
| *Composite LOF Factor* | 0.6937 | -0.5630 | -0.7446 | -0.7750 | 0.4000 | 0.1750 | 0.3429 | 0.6186 | |
| | *0.0041* | *0.0289* | *0.0015* | *0.0007* | *0.1396* | *0.5327* | *0.2109* | *0.0140* | |

**Table 4**
**Determinants of Domestic and Foreign Institutional Ownership**

This table reports estimates from time-series cross-sectional regressions of foreign and domestic institutional ownership on firm characteristics. The coefficients are the time-series average of the coefficients estimated from quarterly cross-sectional regressions from April 1, 1990 to December 31, 2007. The sample consists of firm-quarters with institutional ownership from CDA/Spectrum Institutional (13F) Holdings for which the locations of firm and institution headquarters are available. Foreign (domestic) institutional investors are institutional investors whose headquarters are located outside (in) the U.S. Foreign (domestic) institutional ownership is computed as the number of shares held by foreign (domestic) institutional investors divided by total shares outstanding. Matching domestic institutional ownership represents ownership held by domestic institutions whose size, type, churn rate, and age are matched with those of foreign institutions. Foreign countries are classified as either high or low liability of foreignness (LOF) countries according to the sample median *Composite LOF Factor* that is created from principal components analysis among eight LOF factors (*GAAP Difference*, *Investor Protection*, *Disclosure Quality*, *Earnings Quality*, *Export*, *Distance*, *Cultural Distance*, and *Non-English*). To compare domestic and foreign institutional ownership that have very different distributions, all ownership variables are standardized to have zero mean and unit variance. The appendix provides a detailed description of the construction of the variables. All variables are estimated at the same quarter-end unless noted otherwise. Numbers in parentheses are *t*-statistics, which are computed as the ratio of the mean of the coefficients from quarterly cross-sectional regressions to the standard error of the distribution of the coefficients. ***, **, * denote significance at the .01, .05, .10 levels, respectively, in a two-tailed test.

| Independent variables | Domestic institutional ownership (1) | Foreign institutional ownership (2) | Matching domestic institutional ownership (3) | Institutional ownership from high LOF countries (4) | Institutional ownership from low LOF countries (5) | Test-of-difference: *t*-statistics (2) – (3) | Test-of-difference: *t*-statistics (4) - (5) |
|---|---|---|---|---|---|---|---|
| Intercept | -0.8879*** | -1.0136*** | -0.0046 | -0.7532*** | -0.5265*** | -13.01*** | -3.79*** |
| | (-26.51) | (-23.72) | (-0.07) | (-14.61) | (-6.21) | | |
| *Illiquidity* | -3.519*** | -1.240*** | -0.126 | -2.841*** | 0.850*** | -2.58** | -5.32*** |
| | (-6.67) | (-4.47) | (-0.28) | (-4.40) | (3.09) | | |
| *Market-to-Book* | -0.0548*** | -0.0292*** | -0.0133*** | -0.0174*** | -0.0311*** | -4.62*** | 4.36*** |
| | (-29.76) | (-22.72) | (-4.00) | (-11.37) | (-13.70) | | |
| *Log (Size)* | 0.1665*** | 0.1514*** | -0.0112 | 0.0610*** | 0.1090*** | 13.11*** | -7.91*** |
| | (23.37) | (13.24) | (-1.33) | (5.34) | (8.41) | | |
| *Return Volatility* | -2.3695*** | -0.4304*** | -1.1441*** | -1.0575*** | 0.2984*** | 6.17*** | -9.69*** |
| | (-24.36) | (-8.29) | (-9.07) | (-13.66) | (2.86) | | |
| $Turnover_{t-6,\,t}$ | 2.9142*** | 1.2297*** | 0.9637*** | 1.7097*** | 0.2757*** | 2.34** | 7.68*** |
| | (27.93) | (8.88) | (9.10) | (10.86) | (5.54) | | |
| *Price ($)* | 0.0114 *** | 0.0008** | 0.0047*** | 0.0039*** | -0.0025*** | -7.89*** | 9.95*** |
| | (25.73) | (2.07) | (11.79) | (14.32) | (-4.47) | | |
| *SP500 (dummy)* | -0.1016*** | 0.1515*** | 0.1567*** | 0.4194*** | -0.0127 | 0.13 | 26.29*** |
| | (-5.98) | (8.10) | (5.70) | (26.32) | (-0.66) | | |
| $MRET_{t-6,\,t}$ | 0.0119 | -0.0532*** | 0.0032 | -0.0080 | -0.0156 | -2.74*** | 0.29 |
| | (0.69) | (-5.44) | (0.18) | (-0.63) | (-0.73) | | |
| $MRET_{t-12,\,t-7}$ | 0.0036 | -0.0338*** | -0.0387** | -0.0221** | -0.0300 | 0.22 | 0.34 |
| | (0.19) | (-3.56) | (-1.97) | (-1.97) | (-1.51) | | |
| *Age (months)* | 0.0002*** | 0.0001*** | 0.0000 | 0.0003*** | -0.0000 | 3.97*** | 7.74*** |
| | (9.81) | (6.82) | (-0.42) | (11.36) | (-0.68) | | |
| *Dividend Yield* | -20.00*** | 3.81*** | -7.95*** | 6.83*** | -2.07 | 6.80*** | 3.36*** |
| | (-12.22) | (4.16) | (-5.32) | (4.67) | (-1.36) | | |
| *R&D* | 0.4837*** | 0.9537*** | -1.1275*** | 1.1265*** | -0.8968** | 5.34*** | 4.71*** |
| | (3.03) | (4.52) | (-4.24) | (5.23) | (-2.18) | | |
| *Accruals* | -0.1966*** | -0.0938*** | -0.0448 | -0.1795*** | -0.0366 | -1.12 | -2.53** |
| | (-10.10) | (-5.24) | (-1.14) | (-7.52) | (-0.72) | | |
| Observations | 174,574 | 174,574 | 148,579 | 160,165 | 160,165 | - | - |
| Average $R^2$ | 0.45 | 0.24 | 0.06 | 0.28 | 0.07 | - | - |

**Table 5**
**Regression of Future Returns on Lagged Levels of and Changes in Foreign and Domestic Institutional Ownership**

This table reports the estimates from the time-series cross-sectional regressions of one-quarter-ahead returns on lagged levels of foreign and domestic institutional ownership in quarter *t*-1 (*Foreign Institutional Ownership*$_{t-1}$ and *Domestic Institutional Ownership*$_{t-1}$), changes in foreign and domestic institutional ownership from quarter *t*-1 to quarter *t* (*ΔForeign Institutional Ownership* and *ΔDomestic Institutional Ownership*), and other firm characteristics. Foreign (domestic) institutional investors are institutional investors whose headquarters are located outside (in) the U.S. Foreign countries are classified as either high or low liability of foreignness (LOF) countries according to the sample median of each of the eight country-specific variables (*GAAP Difference*, *Investor Protection*, *Disclosure Quality*, *Earnings Quality*, *Export*, *Distance*, *Cultural Distance*, and *Non-English*) and the *Composite LOF Factor* that is created from principal components analysis among eight LOF variables. Based on each of LOF factors, *ΔForeign Institutional Ownership*$_t$ is decomposed into the change in ownership by foreign institutions from high LOF countries (*ΔHigh LOF Foreign Inst. Ownership*$_t$) and the change in ownership by foreign institutions from low LOF countries (*ΔLow LOF Foreign Inst. Ownership*$_t$).The coefficients are the time-series average of the coefficients estimated from quarterly cross-sectional regressions from April 1, 1990 to December 31, 2007. The sample consists of firm-quarters with institutional ownership from CDA/Spectrum Institutional (13F) Holdings for which the locations of firm and institution headquarters are available. The appendix provides a detailed description of the construction of the variables. All variables are estimated at the same quarter-end unless noted otherwise. Numbers in parentheses are *t*-statistics, which are computed as the ratio of the mean of the coefficients from quarterly cross-sectional regressions to the standard error of the distribution of the coefficients. ***, **, * denote significance at the .01, .05, .10 levels, respectively, in a two-tailed test.

| | | | | Foreign institutional ownership | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Foreign institutional ownership | Domestic institutional ownership | Foreign & domestic institutional ownership | GAAP Difference | Investor Protection | Disclosure Quality | Earnings Quality | Export | Distance | Cultural Distance | Non-English | Composite LOF Factor |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| Intercept | 0.0299*** | 0.0268*** | 0.0299*** | 0.0308*** | 0.0303*** | 0.0297*** | 0.0307*** | 0.0304*** | 0.0305*** | 0.0297*** | 0.0304*** | 0.0302*** |
| | (2.85) | (2.84) | (2.84) | (2.83) | (2.76) | (2.70) | (2.80) | (2.78) | (2.79) | (2.70) | (2.77) | (2.74) |
| *Total Inst. Ownership*$_{t-1}$ | 0.0107* | | | | | | | | | | | |
| | (1.88) | | | | | | | | | | | |
| *Δ Total Inst. Ownership*$_t$ | 0.0020 | | | | | | | | | | | |
| | (0.19) | | | | | | | | | | | |
| *Foreign Inst. Ownership*$_{t-1}$ | 0.0184 | | 0.0270 | | | | | | | | | |
| | (0.60) | | (0.90) | | | | | | | | | |
| *Δ Foreign Inst. Ownership*$_t$ | -0.1273* | | -0.1109* | | | | | | | | | |
| | (-1.86) | | (-1.69) | | | | | | | | | |
| *Domestic Inst. Ownership*$_{t-1}$ | | 0.0126** | 0.0102* | | | | | | | | | |
| | | (2.24) | (1.78) | | | | | | | | | |
| *Δ Domestic Inst. Ownership*$_t$ | | 0.0037 | 0.0008 | | | | | | | | | |
| | | (0.36) | (0.07) | | | | | | | | | |
| *Low LOF Foreign Inst. Ownership*$_{t-1}$ | | | | -0.0038 | -0.0036 | 0.0165 | -0.0090 | -0.0126 | -0.0048 | 0.0114 | 0.0275 | 0.0233 |
| | | | | (-0.07) | (-0.08) | (0.58) | (-0.14) | (-0.31) | (-0.07) | (0.40) | (0.80) | (0.58) |
| *Δ Low LOF Foreign Inst. Ownership*$_t$ | | | | -0.1076 | 0.1525 | 0.0686 | 0.0219 | 0.0608 | 0.0570 | 0.0605 | -0.1628* | 0.0120 |
| | | | | (-0.79) | (1.06) | (0.74) | (0.12) | (0.38) | (0.26) | (0.66) | (-1.65) | (0.12) |
| *High LOF Foreign Inst. Ownership*$_{t-1}$ | | | | 0.0209 | 0.0557 | 0.0330 | 0.0326 | 0.0170 | 0.0395 | 0.0420 | 0.2384 | 0.0640 |
| | | | | (0.30) | (1.18) | (0.56) | (0.66) | (0.33) | (0.77) | (0.68) | (1.42) | (1.31) |
| *Δ High LOF Foreign Inst. Ownership*$_t$ | | | | -0.5011** | -0.2625** | -0.3493*** | -0.2800** | -0.3112** | -0.3534** | -0.3113** | -0.8988** | -0.3181** |
| | | | | (-2.21) | (-1.97) | (-2.61) | (-2.23) | (-2.30) | (-2.34) | (-2.22) | (-2.06) | (-2.40) |
| *Market-to-Book* | -0.0024*** | -0.0032*** | -0.0024*** | -0.0023*** | -0.0023*** | -0.0023*** | -0.0023*** | -0.0023*** | -0.0023*** | -0.0023*** | -0.0023*** | -0.0023*** |
| | (-3.28) | (-4.46) | (-3.21) | (-2.99) | (-2.98) | (-3.00) | (-3.01) | (-3.04) | (-3.00) | (-3.02) | (-2.98) | (-3.02) |
| *Log (Size)* | 0.0012 | 0.0019 | 0.0012 | 0.0015 | 0.0014 | 0.0015 | 0.0014 | 0.0015 | 0.0015 | 0.0015 | 0.0015 | 0.0014 |
| | (0.87) | (1.57) | (0.89) | (1.09) | (1.04) | (1.08) | (1.04) | (1.08) | (1.07) | (1.10) | (1.08) | (1.05) |
| *Return Volatility* | -0.0970** | -0.0794*** | -0.0950** | -0.0931** | -0.0928** | -0.0905** | -0.0926** | -0.0918** | -0.0931** | -0.0906** | -0.0920** | -0.0920** |
| | (-2.57) | (-2.96) | (-2.51) | (-2.38) | (-2.39) | (-2.30) | (-2.37) | (-2.35) | (-2.40) | (-2.31) | (-2.34) | (-2.37) |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *$Turnover_{t-6,\,t}$* | 0.0146 | -0.0048 | 0.0124 | 0.0212 | 0.0206 | 0.0202 | 0.0213 | 0.0212 | 0.0213 | 0.0204 | 0.0205 | 0.0200 |
| | (0.87) | (-0.31) | (0.74) | (1.27) | (1.22) | (1.21) | (1.28) | (1.26) | (1.28) | (1.22) | (1.24) | (1.20) |
| *Price* | -0.0002** | -0.0002* | -0.0002** | -0.0002* | -0.0002* | -0.0002* | -0.0002* | -0.0002* | -0.0002* | -0.0002* | -0.0002* | -0.0002* |
| | (-2.05) | (-1.79) | (-2.03) | (-1.90) | (-1.94) | (-1.86) | (-1.94) | (-1.90) | (-1.94) | (-1.86) | (-1.87) | (-1.93) |
| *SP500* | -0.0020 | -0.0023 | -0.0021 | -0.0023 | -0.0028 | -0.0025 | -0.0024 | -0.0023 | -0.0024 | -0.0025 | -0.0025 | -0.0028 |
| | (-0.58) | (-0.64) | (-0.59) | (-0.64) | (-0.75) | (-0.69) | (-0.67) | (-0.65) | (-0.67) | (-0.68) | (-0.69) | (-0.77) |
| *$MRET_{t-6,\,t}$* | 0.0306*** | 0.0331*** | 0.0303*** | 0.0288*** | 0.0291*** | 0.0285*** | 0.0288*** | 0.0286*** | 0.0287*** | 0.0285*** | 0.0287*** | 0.0292*** |
| | (5.47) | (6.15) | (5.42) | (5.19) | (5.26) | (5.16) | (5.19) | (5.17) | (5.18) | (5.15) | (5.19) | (5.28) |
| *$MRET_{t-12,\,t-7}$* | 0.0181*** | 0.0174*** | 0.0178*** | 0.0179*** | 0.0185*** | 0.0182*** | 0.0184*** | 0.0182*** | 0.0185*** | 0.0183*** | 0.0182*** | 0.0184*** |
| | (3.06) | (3.68) | (2.99) | (2.86) | (2.92) | (2.87) | (2.95) | (2.88) | (2.96) | (2.88) | (2.88) | (2.90) |
| *Age* | 0.0000 | -0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | (0.08) | (-0.34) | (0.08) | (0.23) | (0.09) | (0.14) | (0.14) | (0.20) | (0.10) | (0.13) | (0.18) | (0.02) |
| *Dividend Yield* | 0.1234 | 0.1664 | 0.1198 | 0.1650 | 0.1551 | 0.1670 | 0.1578 | 0.1446 | 0.1634 | 0.1681 | 0.1743 | 0.1629 |
| | (0.45) | (0.63) | (0.43) | (0.58) | (0.54) | (0.58) | (0.55) | (0.50) | (0.57) | (0.58) | (0.60) | (0.56) |
| *R&D* | 0.1370 | 0.1475* | 0.1368 | 0.1198 | 0.1258 | 0.1209 | 0.1203 | 0.1206 | 0.1213 | 0.1225 | 0.1216 | 0.1229 |
| | (1.49) | (1.80) | (1.48) | (1.28) | (1.34) | (1.28) | (1.29) | (1.29) | (1.30) | (1.30) | (1.30) | (1.30) |
| *Accruals* | -0.0572*** | -0.0517*** | -0.0585*** | -0.0613*** | -0.0606*** | -0.0607*** | -0.0610*** | -0.0610*** | -0.0607*** | -0.0608*** | -0.0611*** | -0.0609*** |
| | (-5.43) | (-6.98) | (-5.57) | (-5.29) | (-5.26) | (-5.30) | (-5.28) | (-5.30) | (-5.27) | (-5.30) | (-5.36) | (-5.33) |
| *Test-of-difference in coefficients between Δ High and Δ Low LOF Foreign Inst. $Ownership_t$ (t-statistics)* | - | - | - | 1.69* | 2.68*** | 2.90*** | 1.69* | 1.97** | 1.83* | 2.48** | 1.73* | 2.28** |
| Observations | 174,574 | 179,003 | 174,574 | 160,165 | 160,165 | 160,165 | 160,165 | 160,165 | 160,165 | 160,165 | 160,165 | 160,165 |
| Average $R^2$ | 0.07 | 0.06 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 |

**Table 6**
**Effect of Liability of Foreignness (LOF) on Future Returns across Firms with Different Information Asymmetry Levels**

This table reports estimates from time-series cross-sectional regressions of one-quarter-ahead returns on changes in foreign institutional ownership from quarter *t*-1 to quarter *t* (*ΔForeign Institutional Ownership*), levels of foreign institutional ownership in quarter *t*-1 (*Foreign Institutional Ownership*$_{t-1}$), and other firm characteristics. Foreign countries are classified as either high or low liability of foreignness (LOF) countries according to the sample median of the *Composite LOF Factor* that is created from principal components analysis among eight LOF factors (*GAAP Difference*, *Investor Protection*, *Disclosure Quality*, *Earnings Quality*, *Export*, *Distance*, *Cultural Distance*, and *Non-English*). Based on the *Composite LOF Factor*, *ΔForeign Institutional Ownership*$_t$ is decomposed into the change in ownership by foreign institutions from high LOF countries (*ΔHigh LOF Foreign Inst. Ownership*$_t$) and the change in ownership by foreign institutions from low LOF countries (*ΔLow LOF Foreign Inst. Ownership*$_t$). To classify firms into high and low information asymmetry firms, we perform principal components analysis among four information asymmetry variables (firm size, return volatility, analyst forecast dispersion, and R&D intensity) and create a single information asymmetry factor. We use the sample median of this information asymmetry factor to divide firms into high and low information asymmetry firms. The coefficients are the time-series average of the coefficients estimated from quarterly cross-sectional regressions from April 1, 1990 to December 31, 2007. The sample consists of firm-quarters with institutional ownership from CDA/Spectrum Institutional (13F) Holdings for which the locations of firm and institution headquarters are available. Foreign institutional investors are institutional investors whose headquarters are located outside the U.S. The appendix provides a detailed description of the construction of the variables. All variables are estimated at the same quarter-end unless noted otherwise. Numbers in parentheses are *t*-statistics, which are computed as the ratio of the mean of the coefficients from quarterly cross-sectional regressions to the standard error of the distribution of the coefficients. ***, **, * denote significance at the .01, .05, .10 levels, respectively, in a two-tailed test.

| | High Information Asymmetry firms (1) | Low Information Asymmetry firms (2) | Test-of-difference: *t*-statistics |
|---|---|---|---|
| Intercept | 0.0289* | 0.0442*** | -1.17 |
| | (1.93) | (2.97) | |
| *Low LOF Foreign Inst. Ownership*$_{t-1}$ | 0.0132 | -0.0127 | 0.32 |
| | (0.21) | (-0.21) | |
| *Δ Low LOF Foreign Inst. Ownership*$_t$ | 0.2542 | -0.0250 | 1.16 |
| | (1.47) | (-0.16) | |
| *High LOF Foreign Inst. Ownership*$_{t-1}$ | 0.0528 | 0.0373 | 0.66 |
| | (0.72) | (0.68) | |
| *Δ High LOF Foreign Inst. Ownership*$_t$ | -0.2932** | -0.1120 | -1.70* |
| | (-1.96) | (-0.82) | |
| *Market-to-Book* | -0.0028*** | -0.0013* | -1.27 |
| | (-3.06) | (-1.93) | |
| *Log (Size)* | 0.0024 | -0.0021 | 2.12** |
| | (1.28) | (-1.56) | |
| *Return Volatility* | -0.0803** | 0.0408 | -2.16** |
| | (-2.15) | (0.66) | |
| *Turnover*$_{t-6,\ t}$ | -0.0083 | 0.0411** | -1.85* |
| | (-0.50) | (1.96) | |
| *Price* | -0.0002 | -0.0002 | -0.14 |
| | (-1.06) | (-1.63) | |
| *SP500* | -0.0036 | 0.0030 | -1.15 |
| | (-0.55) | (0.94) | |
| *MRET*$_{t-6,\ t}$ | 0.0266*** | 0.0231*** | 0.59 |
| | (3.58) | (2.73) | |
| *MRET*$_{t-12,\ t-7}$ | 0.0116** | 0.0179** | -0.90 |
| | (2.07) | (2.14) | |
| *Age* | 0.0000 | -0.0000 | 1.01 |
| | (0.48) | (-1.09) | |
| *Dividend Yield* | 0.0621 | 0.0841 | -0.05 |
| | (0.15) | (0.25) | |
| *R&D* | 0.1771* | 0.2575 | -0.42 |
| | (1.81) | (1.39) | |
| *Accruals* | -0.0734*** | -0.0823*** | 0.43 |
| | (-5.48) | (-5.42) | |
| *Test-of-difference in coefficients between Δ High and Δ Low LOF Foreign Inst. Ownership*$_t$*: (t-statistics)* | 2.36** | 0.42 | - |
| Observations | 58,223 | 52,093 | - |
| Average $R^2$ | 0.07 | 0.07 | - |

**Table 7**
**Returns (%) on Portfolios Sorted According to Changes in Domestic and Foreign Institutional Ownership**

This table presents the time-series average of annualized quarterly value-weighted returns on portfolios sorted according to changes in foreign and domestic institutional ownership. Foreign countries are classified as either high or low liability of foreignness (LOF) countries according to the sample median of the *Composite LOF Factor* that is created from principal components analysis among eight LOF factors (*GAAP Difference*, *Investor Protection*, *Disclosure Quality*, *Earnings Quality*, *Export*, *Distance*, *Cultural Distance*, and *Non-English*). Each quarter, stocks are sorted into deciles on the basis of the change in domestic and foreign (high vs. low foreign liability countries') ownership from quarter *t*-1 to quarter *t*: annualized one-quarter-ahead value-weighted returns are then computed on the decile portfolios. High-Low is a zero-cost investment (hedge portfolio) strategy, which takes a long position in portfolio D10 (the decile portfolio with the largest ownership increase) and a short position in portfolio D1 (the decile portfolio with the largest ownership decrease), D10 - D1. The sample consists of firm-quarters with institutional ownership from CDA/Spectrum Institutional (13F) Holdings for which the locations of firm and institution headquarters are available from April 1, 1996 to December 31, 2007. Foreign (domestic) institutional investors are institutional investors whose headquarters are located outside (in) the U.S. Foreign (domestic) institutional ownership is computed as the number of shares held by foreign (domestic) institutional investors divided by total shares outstanding. *Δ Foreign (Domestic) Institutional Ownership* is the change in foreign (domestic) ownership from quarters *t-1* to *t*. Risk-adjusted returns are benchmark-adjusted returns based on Daniel, Grinblatt, Titman, and Wermers (1997).

| | Δ Foreign institutional Ownership (*p*-value) (1) | Δ Foreign institutional Ownership | | Δ Domestic institutional ownership (*p*-value) (4) | Test-of-difference (*p*-value) (2) - (3) |
|---|---|---|---|---|---|
| | | High LOF countries (*p*-value) (2) | Low LOF countries (*p*-value) (3) | | |
| Low (D1) | 13.19 | 13.67 | 12.06 | 10.16 | 1.61 |
| | (0.01) | (<0.01) | (<0.01) | (0.06) | (0.14) |
| High (D10) | 11.13 | 11.14 | 11.56 | 10.72 | -0.43 |
| | (0.03) | (<0.01) | (<0.01) | (0.04) | (0.71) |
| High-Low (Raw) | -2.06 | -2.53 | -0.50 | 0.56 | -2.03 |
| | (0.12) | (0.21) | (0.67) | (0.66) | (0.24) |
| High-Low (Risk-adjusted) | -2.18 | -2.85 | 0.07 | 0.12 | -2.92 |
| | (0.03) | (0.06) | (0.95) | (0.89) | (0.06) |
| Observations | 142,275 | 142,275 | 142,275 | 142,275 | |

**Appendix**
**Variable definitions**

This appendix provides a detailed description of the construction of all the variables used in the tables.

| Variable | Definition |
|---|---|
| **Ownership-specific Variables:** | |
| *Foreign (Domestic) Institutional Ownership$_{t-1}$* | Number of shares held by foreign (domestic) institutional investors divided by total shares outstanding in quarter *t-1*. |
| *Δ Foreign (Domestic) Institutional Ownership$_t$* | Change in foreign (domestic) institutional ownership from quarters *t-1* to *t*. |
| *High (Low) LOF Foreign Inst. Ownership$_{t-1}$* | Number of shares held by foreign institutional investors who are from countries with high (low) LOF factor, divided by total shares outstanding in quarter *t-1*. Foreign countries are classified as either high or low LOF countries according to the sample median of each of the eight country-specific factors (*GAAP Difference*, *Investor Protection*, *Disclosure Quality*, *Earnings Quality*, *Export*, *Distance*, *Cultural Distance*, and *Non-English*) and the *Composite LOF Factor*. |
| *Δ High (Low) LOF Foreign Inst. Ownership$_t$* | Change in foreign institutional ownership from countries with high (low) LOF factor from quarters *t-1* to *t*. |
| *Total Institutional Ownershipt-1* | Number of shares held by all institutional investors divided by total shares outstanding in quarter t-1. |
| *Δ Total Institutional Ownershipt* | Change in total institutional ownership from quarters t-1 to t. |
| **Firm-specific Variables:** | |
| *Accruals$_t$* | Total accruals calculated as net income less operating cash, divided by lagged total assets. |
| *Age$_t$* | Number of months passed since the first appearance of a firm's stock return in the CRSP database. |
| *Dividend Yield$_t$* | Cash dividend divided by share price. We may want to move the above three right above market to book. |
| *Illiquidity$_t$* | Quarter *t-1* average daily absolute return divided by the daily dollar trading volume times one thousand (Amihud 2002). |
| *Market-to-Book$_t$* | Ratio of the market capitalization to the book value of equity in quarter *t*. |
| *MRET$_{t-6,\ t}$* | Preceding 6-month cumulative market-adjusted return. |
| *MRET$_{t-12,\ t-7}$* | Penultimate 6-month cumulative market-adjusted return. |
| *Price$_t$* | Quarter-end share price from COMPUSTAT. |
| *R&D$_t$* | Research and development expenditures divided by total assets. |
| *RET$_{t,t+3}$* | One-quarter-ahead stock return (i.e., buy-and-hold return). |
| *Return Volatility$_t$* | Standard deviation of monthly returns over the previous 24 months. |
| *Size$_t$* | Market capitalization calculated as the number of shares outstanding times quarter-end stock price in quarter *t*. |
| *SP500$_t$ (indicator)* | Indicator that takes the value of one if the firm is included in the S&P 500 index, and zero otherwise. |
| *Turnover$_{t-6,\ t}$* | Ratio of the average monthly trading volume to the number of shares outstanding over the previous 6 months. |
| **LOF Characteristics** | |
| Institutional Distance: | |
| *GAAP Difference* | GAAP difference between the foreign country and the U.S. calculated by identifying 21 key accounting areas from prior literature and using both IAS section numbers and the accompanying text from *GAAP 2001: A Survey of National Accounting Rules Benchmarked Against International Accounting Standards* (Nobes 2001) (Bae, Tan, and Welker 2008). |
| *Investor Protection* | A principal component of private enforcement and anti-director rights, scaled from 0 to 10 (La Porta, Lopez-de-Silanes, Shleifer, and Vishny 1999). |
| Information Costs: | |

| | |
|---|---|
| *Disclosure Quality* | An index created by the Center for International Financial Analysis and Research to rate the annual reports of the companies of the corresponding countries on their inclusion or omission of 90 items falling in the categories of general information, income statements, balance sheets, funds flow statement, accounting standards, stock data, and special items (La Porta, Lopez-de-Silanes, Shleifer, and Vishny 1998). |
| *Earnings Quality* | A composite index of the following four earnings management measures: 1) a country's median ratio of the firm-level standard deviation of operating income and operation cash flow, 2) a country's Spearman correlation between the change in accruals and the change in cash flow from operations, 3) a country's median ratio of the absolute value of accruals and the absolute value of cash flow from operations, and 4) the number of "small profits" divided by the number of "small losses" for each country (Leuz, Nanda, and Wysocki 2003). We multiply this composite index by negative one. |
| Unfamiliarity Costs: | |
| *Export* | A country's total exports in US$ billion. |
| *Distance* | Physical distance between the economic center (the largest city in terms of population) of the foreign country and the U.S. |
| Cultural Differences: | |
| *Cultural Distance* | Kogut and Singh's (1988) index of *Cultural Distance*. The index is based on the differences in scores along each of Hofstede's (2001) four cultural dimensions - power distance, uncertainty avoidance, individualism, and masculinity. Specifically, $CD_j = \sum_{i=1}^{4} \frac{(I_{ij} - I_{ius})^2 / V_i}{4}$, where $CD_j$ is the cultural distance between country $j$ and the U.S., $I_{ij}$ is country $j$'s score on the $i$th cultural dimension, $I_{us}$ is the score of the U.S. on this dimension, and $V_i$ is the variance of the score on the dimension. |
| *Non-English* | Indicator that takes the value of one if English is not the primary language of the foreign country and zero otherwise. |
| *Composite LOF Factor* | A composite factor from principal components analysis among eight LOF variables above. |